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MONTANA'S CONSTRUCTION INDUSTRY

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MONTANA'S CONSTRUCTION INDUSTRY

A SURVEY ON OCCUPATIONAL EMPLOYMENT
WITH LABOR MARKET CHARACTERISTICS

1976

STATE OF MONTANA

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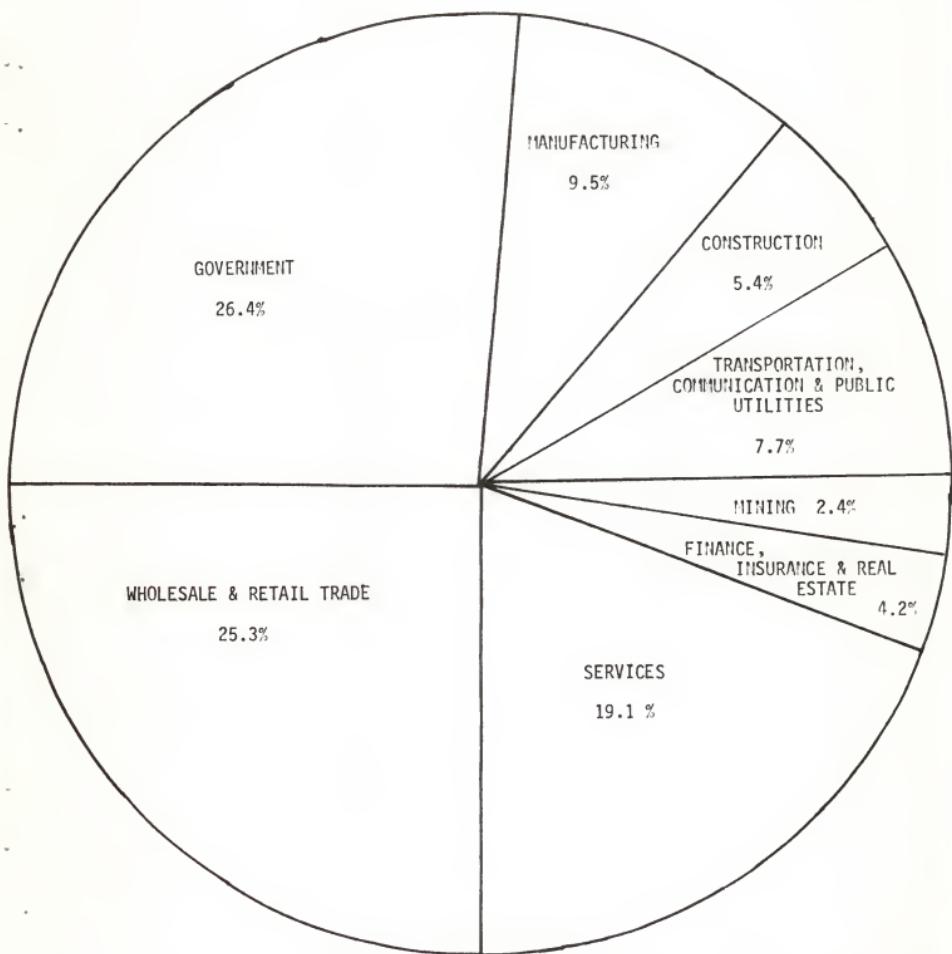
We would also like to thank the state members in our 23 job service offices. These dedicated individuals did a professional job in contacting the sampled employers and explaining the purpose of the survey.

In regard to the processing, analysis, and computer services, our sincere appreciation goes to the U. S. Bureau of Labor Statistics for their valuable technical help, as well as our own data processing staff.

Finally, we would like to thank our cooperating partners; the Governor's Manpower Training Council and the Superintendent of Public Instruction - Vocational Education, for their patience and financial help.

PERCENT DISTRIBUTION OF MONTANA'S NON-FARM WAGE AND SALARY EMPLOYMENT
BY MAJOR INDUSTRIAL GROUP

1976



Note: The distribution figures are based on revised 1976 annual average on the 1972 Standard Industrial Classification Manual and are not comparable to those figures based on the 1967 S. I. C. Manual.

TABLE I

EMPLOYMENT IN THE CONSTRUCTION INDUSTRY
IN THE UNITED STATES (SIC 15-17)
1960 - 1975

<u>YEAR</u>	<u>ANNUAL AVERAGE EMPLOYMENT</u>
1960	2,885,000
1961	2,816,000
1962	2,902,000
1963	2,963,000
1964	3,050,000
1965	3,186,000
1966	3,275,000
1967	3,208,000
1968	3,306,000
1969	3,525,000
1970	3,536,000
1971	3,639,000
1972	3,831,000
1973	4,015,000
1974	3,957,000
1975	3,512,000

Source: Bureau of the Census, U. S. Department
of Housing and Urban Development.

TABLE II
 TOTAL WAGE AND SALARY EMPLOYMENT
 IN THE CONSTRUCTION INDUSTRY
 (SIC 15 - 17)

1960 - 1976

<u>YEAR</u>	<u>ANNUAL AVERAGE EMPLOYMENT</u>
1960 ^{1/}	11,000
1961	11,500
1962	12,600
1963	12,300
1964	11,400
1965	12,000
1966	11,600
1967	11,700
1968	11,500
1969	10,500
1970	11,000
1971	11,700
1972	13,100
1973	14,000
1974	13,800
1975	12,400
1976	11,300

1/ All data are rounded to the nearest hundred.

TABLE III
 TOTAL CONSTRUCTION EMPLOYMENT AS A PERCENT OF TOTAL EMPLOYMENT
 1970, 1974 AND PROJECTIONS FOR 1985^{1/}
 (SIC 15, 16, 17)

INDUSTRY	1970		1974		PROJECTED	
	EMPLOYMENT	PCT.	EMPLOYMENT	PCT.	EMPLOYMENT	PCT.
CONSTRUCTION	18,100	7.10	23,100	7.72	23,200	6.77
General Building Construction	3,100	1.20	6,600	2.20	4,300	1.24
Heavy and Highway Construction	9,500	3.74	8,800	2.94	11,400	3.32
Special Trade Contractors	5,500	2.16	7,700	2.58	7,600	2.21

^{1/} All data are rounded to the nearest hundred.

Note: Above employment totals include self-employed and unpaid family workers, as well as affiliated government workers and is not comparable to other wage and salary employment totals in this publication.

OCCUPATIONAL EMPLOYMENT
THE CONSTRUCTION INDUSTRY
SIC (15 - 17)

GENERAL BUILDING CONSTRUCTION
HEAVY AND HIGHWAY CONSTRUCTION
SPECIAL TRADE CONSTRUCTION

TABLE IV

ESTIMATED EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP
IN THE CONTRACT CONSTRUCTION INDUSTRY
(SIC 15-17)

<u>OCCUPATIONAL TITLE</u>	<u>ESTIMATED EMPLOYMENT</u>	<u>PERCENT of TOTAL</u>
Total All Occupations	16,170	100.0
Managers and Officers	1,490	9.2
Professional Occupations	310	1.9
Technical Occupations	100	0.6
Service Occupations	150	0.9
Maintenance, Construction Repair, Material Handling, Power Plant, Mining, and Processing Occupations	13,070	80.8
Clerical Occupations	940	5.8
Sales Occupations	110	0.7

Occupational data are rounded to the nearest 10.

TABLE V
 ESTIMATED EMPLOYMENT FOR THE TEN LARGEST OCCUPATIONS
 IN THE CONTRACT CONSTRUCTION INDUSTRY
 (SIC 15 - 17)

OCCUPATIONAL TITLE	ESTIMATED EMPLOYMENT	PERCENT OF TOTAL
CARPENTER	2470 ^{1/}	15.3
ALL OTHER LABORERS	2270	14.0
HEAVY EQUIPMENT OPERATORS	1680	10.4
MANAGERS AND OFFICERS	1480	9.2
ELECTRICIAN	770*	4.8
PLUMBER &/OR PIPEFITTER	740*	4.6
TRUCK DRIVER	670	4.1
FOREMAN, MAINTENANCE	500	3.1
CARPENTER HELPER	490	3.0
SHEET METAL WORKER	<u>320</u>	<u>2.0</u>
TOTAL	11,390	70.4
TOTAL ALL OCCUPATIONS IN THE CONSTRUCTION INDUSTRY	<u>16,170</u>	<u>100.0</u>

^{1/} Percentage distribution may not add to 100 due to rounding.

* Does not include occupations with relative errors above allowable range.

PERCENT DISTRIBUTION OF EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP
IN THE CONTRACT CONSTRUCTION INDUSTRY

AUGUST 1976

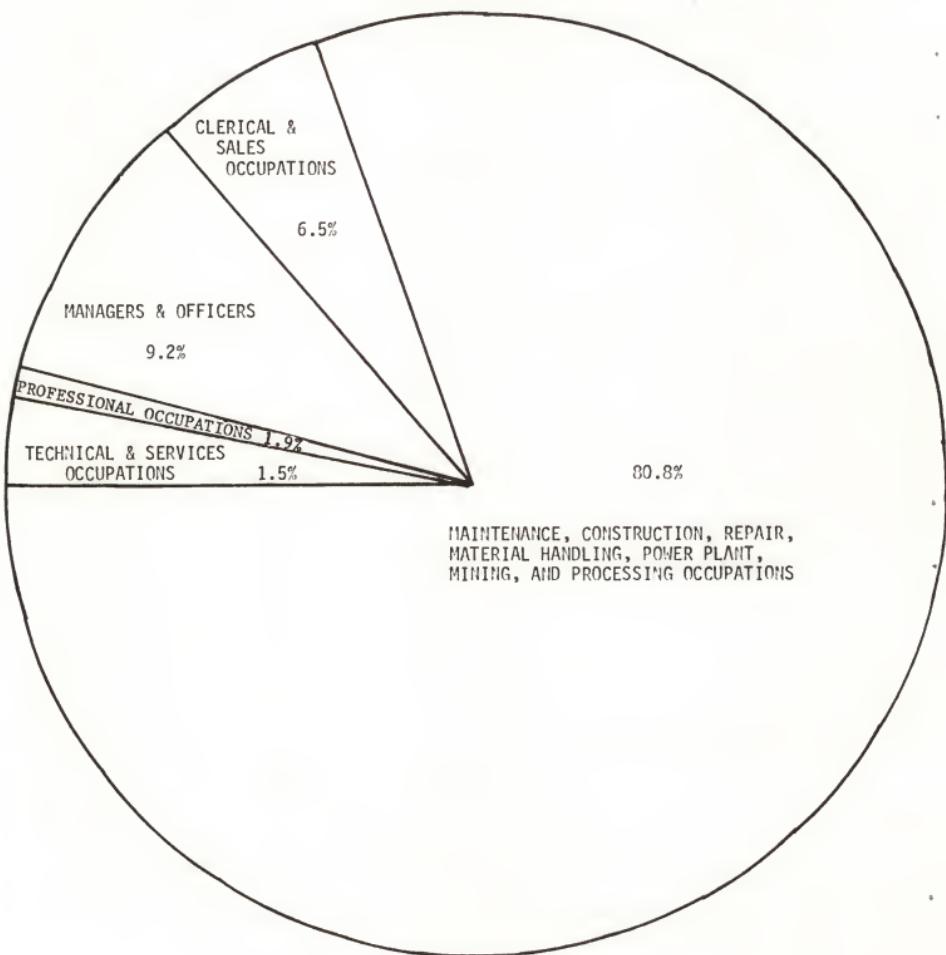


TABLE VI
PERCENT DISTRIBUTION OF TOTAL EMPLOYMENT IN CONSTRUCTION
BY MAJOR OCCUPATIONAL GROUP

MAJOR OCCUPATIONAL GROUP	<u>INDUSTRY</u>			TOTAL
	SURVEY INDUSTRY <u>15</u>	SURVEY INDUSTRY <u>16</u>	SURVEY INDUSTRY <u>17</u>	
10000 Managers & Officers	8.3	8.1	11.1	9.2
20000 Professional Occupations	2.1	2.2	1.6	1.9
30000 Technical Occupations	0.4	0.6	0.9	0.6
40000 Service Occupations	0.8	0.4	1.4	0.9
50000 Maintenance, Construction, Repair, Material Handling, & Power Plant Occupations	82.5	84.8	76.0	80.8
60000 Clerical Occupations	5.0	3.8	8.1	5.8
70000 Sales Occupations	0.9	*	1.0	0.7
TOTAL ALL OCCUPATIONS	100.0	100.0	100.0	100.0

* Occupational distribution less than one tenth of one percent.

TABLE VII
CROSS INDUSTRY EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP

<u>MAJOR OCCUPATIONAL GROUP</u>	<u>INDUSTRY</u>			<u>TOTAL</u>
	<u>SURVEY INDUSTRY 15</u>	<u>SURVEY INDUSTRY 16</u>	<u>SURVEY INDUSTRY 17</u>	
10000 Managers & Officers	470 1/	380	640	1,490
20000 Professional Occupations	120	100	90	310
30000 Technical Occupations	20	30	50	100
40000 Service Occupations	50	20	80	150
50000 Maintenance, Construction, Repair, Material Handling, Power Plant, Mining, & Processing Occupations	4,680	3,990	4,400	13,070
60000 Clerical Occupations	290	180	470	940
70000 Sales Occupations	50	*	60	110
TOTAL ALL OCCUPATIONS	5,680	4,700	5,790	16,170

1/ Occupational data are rounded to the nearest 10.

* Employment is less than 5 people.

THE GENERAL BUILDING CONSTRUCTION INDUSTRY

(SIC 15)

THE REPORT ON EMPLOYMENT
IN THE BUILDING CONSTRUCTION INDUSTRY

INDUSTRY CHARACTERISTICS

The building construction industry consists of those establishments that are engaged in the "construction of residential, farm, industrial, commercial or other buildings". This includes firms dealing in the construction of single family dwellings (SIC 152), and the repair, remodeling and addition of such dwellings. Also included in this group are builders of apartments, motels, hotels, dormitories and other residential buildings other than single family units. Establishments classified in this group have the common element in that the building work is contracted out for another entity's use.

Standard Industrial Classification 153 includes those builders that construct various types of residential buildings on their own account. Examples of firms in this group include: speculative builders, cooperative apartment developers, operative builders, and condominium builders.

The third minor group within the building construction industry includes those builders engaged in the construction, repair or remodeling of non-residential buildings (SIC 154). This category envelopes all types of commercial, and industrial buildings, as well as institutional facilities.

EMPLOYMENT TRENDS

The building construction industry remains as a volatile industry as far as employment patterns are concerned. Traditionally this industry is subject to the business cycle, particularly the loosening and tightening of funds

Source: Standard Industrial Classification Manual, 1972; Executive office of the President, Office of Management and Budget, U.S. Government Printing Office, Page 47.

THE REPORT ON EMPLOYMENT
IN THE BUILDING CONSTRUCTION INDUSTRY

EMPLOYMENT TRENDS (CONT.)

available for mortgage loans. At the same time, there has been an additional boom and bust cycle in home building in particular localities, due to rapid building activities in supply-short cities. This in turn, often led to an overbuilt area, resulting in unemployment.

This has been particularly true in Montana's building industry. In 1960, employment totaled 4,300, but in 1961 it dropped to 3,100 for a loss of 1,200 workers. The next year employment reached 3,400 and in 1963 - 4,200 workers. Because of this up and down movement, it has been very hard to draw conclusions as to the future of the home building industry in Montana. However, because of vast numbers of people born in the post World War II "baby boom" who are now reaching family age, the residential sector is expected to continue an upward growth pattern through the 1980's. This will be accented further in Montana's net in-migration cities, where population growth stimulates additional housing demand. In conclusion, from evidence based on above data, the building industry should remain in an upward trend in employment, with the usual peaks and valleys along the way.

The commercial building market should closely follow the general business expansion in Montana. The high growth in retail-service industries created the demand for the bulk of commercial building activity during the past several decades. This trend is expected to continue in the next 10 years, especially "shopping center" buildings.

THE REPORT ON EMPLOYMENT
IN THE BUILDING CONSTRUCTION INDUSTRY

OCCUPATIONAL CHARACTERISTICS

Maintenance and production workers accounted for about 83% of all workers in the building industry. In that light, it was not surprising that 10 out of the 13 largest specific occupations came from this group. Carpenters filled the largest spot with about 1,980 workers, 35% of all occupations. Other occupations with 200 or more employees included: laborers, managers, carpenter helpers, maintenance foremen, and cement mason helpers.

TABLE VIII

EMPLOYMENT IN THE BUILDING CONSTRUCTION INDUSTRY
IN THE UNITED STATES (SIC 15)
1960 - 1975

<u>YEAR</u>	<u>ANNUAL AVERAGE EMPLOYMENT^{1/}</u>
1960	908,400
1961	874,900
1962	882,100
1963	914,100
1964	949,100
1965	994,000
1966	1,031,500
1967	984,500
1968	1,011,500
1969	1,108,400
1970	1,101,000
1971	1,128,000
1972	1,196,500
1973	1,263,200
1974	1,225,600
1975	1,064,200

Source: Bureau of the Census, U. S. Department
of Housing and Urban Development.

TABLE IX
 TOTAL WAGE AND SALARY EMPLOYMENT
 IN THE GENERAL BUILDING CONSTRUCTION INDUSTRY
 (SIC 15)

1960 - 1976

<u>YEAR</u>	<u>ANNUAL AVERAGE EMPLOYMENT 1/</u>
1960	4,300
1961	3,100
1962	3,400
1963	4,200
1964	3,700
1965	3,300
1966	3,100
1967	3,700
1968	2,900
1969	2,400
1970	2,600
1971	2,900
1972	3,700
1973	4,000
1974	5,400
1975	4,900
1976	4,100

1/ All data are rounded to the nearest 100.

TABLE X

ESTIMATED EMPLOYMENT IN SELECTED OCCUPATIONS IN THE
GENERAL BUILDING CONSTRUCTION INDUSTRY

(SIC 15)

OCCUPATIONAL TITLE	OES CODE	ESTIMATED EMPLOYMENT	RELATIVE ERROR %	PERCENT DISTRIBUTION	PERCENT OF ESTABLISHMENTS REPORTING THE OCCUPATION
TOTAL ALL OCCUPATIONS		<u>5675</u>			
MANAGERS AND OFFICERS		<u>473</u>			
All Other Managers & Officers	19000	473	NA	8.32	68
Research & Development	19000	16	NA	0.28	3
PROFESSIONAL OCCUPATIONS		<u>117</u>			
All Other Engineers	21900	26	NA	0.44	3
Accountants and Auditors	25401	22	38.66	0.38	7
Cost Estimator	25427	51	26.57	0.89	13
All Other Professional Workers	29000	18	NA	0.31	5
TECHNICAL OCCUPATIONS		<u>22</u>			
Draftsman	32003	13	48.88	0.22	5
All Other Technicians	39000	9	NA	0.15	1
SERVICE OCCUPATIONS		<u>46</u>			
All Other Janitors, Porters, & Cleaners	41000	33	40.25	0.58	7
All Other Service Workers	49000	13	NA	0.22	3
MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING, POWER PLANT, MINING & PROCESSING OCCUPATIONS		<u>4681</u>			
All Other Mechanics & Repair	51900	33	NA	0.56	7
Truck Driver	54000	29	44.28	0.51	6
Carpenter	55A47	1984	7.84	34.92	82
Carpenter Apprentice	55A47	36	34.94	0.63	10
Cement Mason	55A51	176	32.92	3.09	16
Foreman, Maintenance	55D29	253	38.00	4.45	24
Heavy Equipment Operator	55D52	87	39.55	1.53	15
Reinforcing Iron Worker	55C52	133	33.72	2.34	16
Structural Steel Worker	55C96	76	NA	1.33	4

ESTIMATED EMPLOYMENT IN SELECTED OCCUPATIONS IN THE
GENERAL BUILDING CONSTRUCTION INDUSTRY
(CONT.)

OCCUPATIONAL TITLE	OES CODE	ESTIMATED EMPLOYMENT	RELATIVE ERROR %	PERCENT DISTRIBUTION	PERCENT OF ESTABLISHMENTS REPORTING THE OCCUPATION
MAINTENANCE, ETC., (CONT.)					
Carpenter Helper	56003	418	23.95	7.35	39
Cement Mason Helper	56004	196	45.49	3.45	11
All Other Helpers Trades	56900	64	NA	1.12	7
All Other Skilled Craftsmen	59001	137	NA	2.41	13
All Other Operatives	59002	124	NA	2.19	13
All Other Laborers	59003	971	NA	17.11	40
CLERICAL OCCUPATIONS					
		<u>285</u>			
Bookkeeper, Hand	61307	111	20.18	1.95	33
General Clerk	61333	58	28.90	1.02	15
Secretary	61368	80	16.95	1.40	25
All Other Office Clerical	61900	36	NA	0.63	3
SALES OCCUPATIONS					
		<u>51</u>			
All Other Salesmen	71900	51	NA	0.89	7

OCCUPATIONS PRESENT IN THE SURVEY
BUT NOT PUBLISHABLE BECAUSE OF RELATIVE ERRORS
GREATER THAN FIFTY PERCENT

Civil Engineer	Mechanical Engineer	Safety Engineer
Guards & Watchmen	Mechanic, Automobile	Diesel Mechanic
Engineering Equipment Mechanic	Mechanic, Maintenance	Air Hammer Operator
Blaster, Construction	Bricklayer	Craneman/Derrickman
Delivery & Routeman	Dry Wall Applicator	Electrician
Metal Fabricator	Oiler	Painter
Plumber &/or Pipefitter	Sheet Metal Worker	Stonemason
Welders & Flamecutters	Bricklayer Helper	Computer Operator
Stenographer	Accounting Clerk	File Clerk
Payroll &/or Timekeeper	Clerical Supervisor	

TABLE XI

ESTIMATED EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP
IN THE GENERAL BUILDING CONSTRUCTION

INDUSTRY (SIC 15)	ESTIMATED EMPLOYMENT	PERCENT OF TOTAL
<u>OCCUPATIONAL TITLE</u>		
TOTAL ALL OCCUPATIONS	5680 ^{1/}	100.0
MANAGERS AND OFFICERS	470	8.3
PROFESSIONAL OCCUPATIONS	120	2.1
TECHNICAL OCCUPATIONS	20	0.4
SERVICE OCCUPATIONS	50	0.8
MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING, POWER PLANT, MINING AND PROCESSING OCCUPATIONS	4680	82.5
CLERICAL OCCUPATIONS	290	5.0
SALES OCCUPATIONS	50	0.9

1/ Occupational data are rounded, and may not add to the total.

TABLE XII

ESTIMATED EMPLOYMENT IN MAJOR SPECIFIC OCCUPATIONS
 IN THE GENERAL BUILDING CONSTRUCTION INDUSTRY
 (SIC 15)

OCCUPATIONAL TITLE	ESTIMATED EMPLOYMENT	PERCENT OF TOTAL
CARPENTER	1980 ^{1/}	34.9
ALL OTHER LABORERS	970	17.1
MANAGERS AND OFFICERS	470	8.3
CARPENTER HELPER	420	7.4
FOREMAN, MAINTENANCE	250	4.5
CEMENT MASON HELPER	200	3.5
CEMENT MASON	180	3.1
ALL OTHER SKILLED CRAFTSMAN	140	2.4
REINFORCING IRON WORKER	130	2.3
ALL OTHER OPERATIVES	120	2.2
BOOKKEEPER, HAND	110	2.0
HEAVY EQUIPMENT OPERATOR	90	1.5
SECRETARY	<u>80</u>	<u>1.4</u>
TOTAL	5140	90.6
TOTAL ALL OCCUPATIONS	<u>5675</u>	<u>100.0</u>

^{1/} Occupational data are rounded, and may not add to the total.

THE HEAVY AND HIGHWAY CONSTRUCTION INDUSTRY

(SIC 16)

THE REPORT ON EMPLOYMENT
IN THE HEAVY AND HIGHWAY CONSTRUCTION INDUSTRY

INDUSTRY CHARACTERISTICS

The heavy and highway construction industry is classified as follows in Standard Industrial Classification Manual, 1972:

1/ "This major group includes general contractors engaged in heavy construction (including new work, additions, improvements, maintenance, and repair) such as highways and streets, bridges, sewers, railroads, irrigation projects, flood control projects and marine construction, and miscellaneous types of construction work other than buildings. General heavy construction contractors who combine a special trade with the contracting are included in this major group."

This group is further broken down into: highway and street construction (SIC 161), and elevated highways and heavy construction (SIC 162). Examples of the former include airport construction, asphalt paving of roads, streets, and sidewalks, athletic field construction, concrete construction of roads, streets etc., golf course construction, guard rail construction for highways, and highway sign installation. Heavy construction consists of bridge, tunnel, and elevated highway building, water, sewer, communication and power line installation, and other miscellaneous heavy construction related projects such as dams, railroads, waste disposal plant construction, rock removal, petroleum refineries, and missile installation.

EMPLOYMENT TRENDS

Averaging just under 4,200 in the seventeen years from 1960 through 1976, employment in the heavy and highway construction industry peaked in 1971, with 5,100 workers. Ironically, the lowest employment was recorded in 1976 when

1/ Standard Industrial Classification Manual, 1972; Executive office of the President, Office of Management and Budget, U.S. Government Printing Office, Page 49.

THE REPORT ON EMPLOYMENT
IN THE HEAVY AND HIGHWAY CONSTRUCTION INDUSTRY

EMPLOYMENT TRENDS (CONT.)

the number of workers fell to 2,600 individuals. This phenomenon was also felt at the national level, with the primary cause being a 4% drop in public construction, the lifeblood of the highway construction industry. Nationally, public construction totaled \$37.3 billion in 1976, which in constant dollars was about one-third below the record level in 1968. Montana's employment picture correlated with the changes in public construction on a national basis. In fact, 1968 employment stood at 4,900 workers, third highest year in the 17 year period. Until 1969, employment remained reasonably stable in Montana's heavy-highway construction industry, with the exception of 1960, when public construction took a sharp dive. Since that time, overall public construction has been on the decline, and with the exception of 1971-1972, Montana's employment picture has borne the effects of this decline. The outlook for 1977 and further will be tied closely to national public construction dollars.

OCCUPATIONAL CHARACTERISTICS

As with the construction industry as a whole, the maintenance and production oriented occupations accounted for a large majority of all workers in the heavy and highway construction industry, (85%). The next largest major occupational group, managers and officers, boasted employment totaling 380, 8.1% of all occupations. The other major groups combined for only 7% of the August 1976 employment.

As expected in an industry consisting primarily of highway construction firms, heavy equipment operators, laborers and truck drivers were the three largest specific occupations. These occupations' total employment reached 2,870 workers, 61% of all occupations.

TABLE XIII

EMPLOYMENT IN THE HEAVY AND HIGHWAY CONSTRUCTION INDUSTRY
IN THE UNITED STATES (SIC 16)
1960 - 1975

<u>YEAR</u>	<u>ANNUAL AVERAGE EMPLOYMENT</u>
1960	585,700
1961	583,300
1962	593,100
1963	599,200
1964	613,900
1965	648,500
1966	673,500
1967	663,700
1968	678,700
1969	701,200
1970	714,800
1971	717,300
1972	739,100
1973	763,700
1974	778,100
1975	703,500

Source: Bureau of the Census, U. S. Department
of Housing and Urban Development.

TABLE XIV

TOTAL WAGE AND SALARY EMPLOYMENT
IN THE HEAVY AND HIGHWAY CONSTRUCTION INDUSTRY

(SIC 16)

1960 - 1976

<u>YEAR</u>	<u>ANNUAL AVERAGE EMPLOYMENT</u>
1960	2,800
1961	4,900
1962	4,700
1963	4,100
1964	4,100
1965	4,500
1966	4,300
1967	4,100
1968	4,900
1969	4,600
1970	4,700
1971	5,100
1972	5,000
1973	4,100
1974	3,400
1975	2,800
1976	2,600

1/ All data are rounded to the nearest hundred.

TABLE XV
ESTIMATED EMPLOYMENT IN SELECTED OCCUPATIONS IN THE
HEAVY & HIGHWAY CONSTRUCTION INDUSTRY
(SIC 16)

OCCUPATIONAL TITLE	OES CODE	ESTIMATED EMPLOYMENT	RELATIVE ERROR %	PERCENT DISTRIBUTION	PERCENT OF ESTABLISHMENTS REPORTING THE OCCUPATION
TOTAL ALL OCCUPATION		<u>4698</u>			
MANAGERS AND OFFICERS		<u>382</u>			
All Other Managers & Officers	19000	382	NA	8.12	87
Research & Development	19000	18	NA	0.38	6
PROFESSIONAL OCCUPATIONS		<u>104</u>			
All Other Engineers	21900	22	NA	0.45	4
Purchasing Agent	25300	13	47.84	0.27	11
Accountants & Auditors	25401	29	38.12	0.61	19
Cost Estimator	25427	27	32.77	0.57	21
All Other Professional Workers	29000	13	NA	0.27	11
TECHNICAL OCCUPATIONS		<u>28</u>			
All Other Engineering Technicians	32900	26	NA	0.54	9
All Other Technicians	39000	2	NA	0.04	2
SERVICE OCCUPATIONS		<u>20</u>			
All Other Janitors, Porters, & Cleaners	41900	18	NA	0.38	13
All Other Service Workers	49000	2	NA	0.04	4
MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING, POWER PLANT, MINING & PROCESSING OCCUPATIONS		<u>3985</u>			
Mechanic, Automobile	51008	33	39.86	0.70	15
Diesel Mechanic	51019	80	34.01	1.70	26
Engineering Equipment Mechanic	51034	29	38.51	0.61	15
All Other Mechanics	51900	22	NA	0.46	11
Truck Driver	54000	574	24.48	12.21	49
Carpenter	55A47	201	48.99	4.27	21
Cement Mason	55A51	49	39.61	1.04	15

ESTIMATED EMPLOYMENT IN SELECTED OCCUPATIONS IN THE
HEAVY & HIGHWAY CONSTRUCTION INDUSTRY
(CONT.)

OCCUPATIONAL TITLE	OES CODE	ESTIMATED EMPLOYMENT	RELATIVE ERROR %	PERCENT DISTRIBUTION	PERCENT OF ESTABLISHMENTS REPORTING THE OCCUPATION
MAINTENANCE, ETC., (CONT.)					
Craneman, Derrickman & Hoistman	55A82	22	49.99	0.46	13
Foreman, Maintenance	55B29	159	18.94	3.38	41
Heavy Equipment Operator	55B52	1308	16.36	27.82	66
Lineman	55B73	137	46.76	2.91	15
All Other Helpers Trades	56900	13	NA	0.27	9
All Other Skilled Craftsman	59001	166	NA	3.53	23
All Other Operatives	59002	199	NA	4.24	11
All Other Laborers	59003	993	NA	19.69	65
CLERICAL OCCUPATIONS		<u>179</u>			
Bookkeeper, Hand	61307	38	34.57	0.80	23
General Clerk	61333	40	36.20	0.85	19
Payroll &/or Timekeeper	61351	20	34.26	0.42	19
Receptionist	61361	9	48.69	0.19	11
Secretary	61368	24	38.34	0.51	21
All Other Office Clerical	61900	35	NA	0.74	24
All Other Plant Clerical	62900	13	NA	0.27	15

OCCUPATIONS PRESENT IN THE SURVEY
BUT NOT PUBLISHABLE BECAUSE OF RELATIVE ERRORS
GREATER THAN FIFTY PERCENT

Civil Engineer	Safety Engineer	Computer Programmer
Personnel & Labor Relations	Electrical Technician	Surveyor
Guards & Watchmen	Mechanic, Maintenance	Maintenance Man, General
Oiler	Welders & Flamcutters	Air Hammer Operator
Chainman, Rodman &/or Lightkeeper	Asphalt Plant Operator	Delivery & Routeman
Fine Grader Man	Fitter	Form Tamper
Industrial Truck Operator	Machinist	Metal Fabricator
Pipe Layer	Reinforcing Iron Worker	Sewer Tapper
Sheet Metal Worker	Structural Steel Worker	Cement Mason Helper
Asphalt Raker	Shipping & Receiving Clerk	Clerical Supervisor
Computer Operator	Keypunch Operator	Clerk Typist
Accounting Clerk	Personnel Clerk	Procurement Clerk
Stock Clerk, Storeroom & Warehouse	Switchboard Operator	

TABLE XVI

ESTIMATED EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP
IN THE HEAVY & HIGHWAY CONSTRUCTION

INDUSTRY

(SIC 16)

<u>OCCUPATIONAL TITLE</u>	<u>ESTIMATED EMPLOYMENT</u>	<u>PERCENT OF TOTAL</u>
TOTAL ALL OCCUPATIONS	4700 ^{1/}	100.0
MANAGERS AND OFFICERS	380	8.1
PROFESSIONAL OCCUPATIONS	100	2.2
TECHNICAL OCCUPATIONS	30	0.6
SERVICE OCCUPATIONS	20	0.4
MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING, POWER PLANT, MINING AND PROCESSING OCCUPATIONS	3990	84.8
CLERICAL OCCUPATIONS	190	3.8

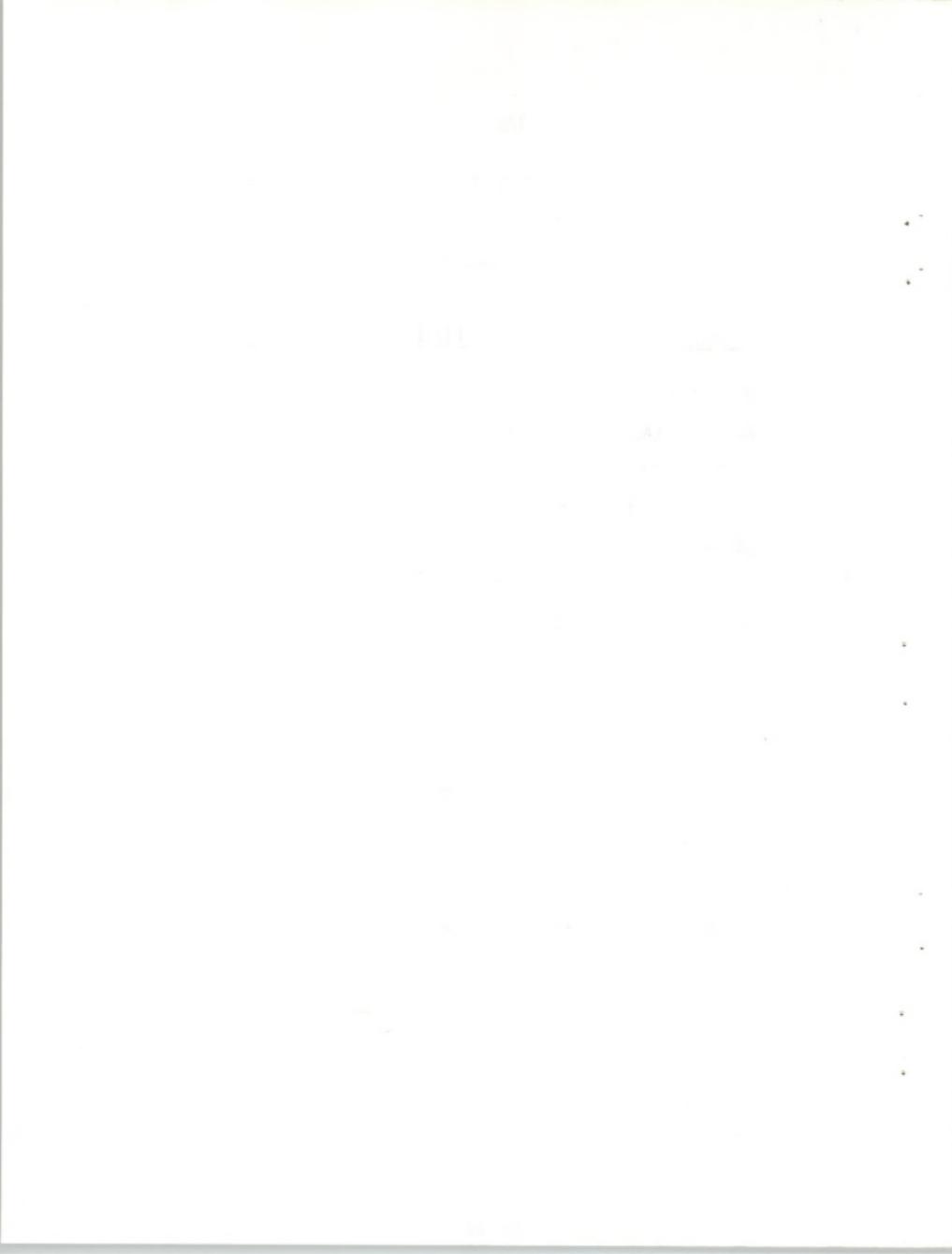
1/ Occupational data are rounded, and may not add to the total.

TABLE XVII

ESTIMATED EMPLOYMENT IN MAJOR SPECIFIC OCCUPATIONS
 IN THE HEAVY & HIGHWAY CONSTRUCTION INDUSTRY
 (SIC 16)

OCCUPATIONAL TITLE	ESTIMATED EMPLOYMENT	PERCENT OF TOTAL
HEAVY EQUIPMENT OPERATORS	1310 ^{1/}	27.8
ALL OTHER LABORERS	990	19.7
TRUCK DRIVER	570	12.2
MANAGERS AND OFFICERS	380	8.1
CARPENTER	200	4.3
ALL OTHER OPERATIVES	200	4.2
ALL OTHER SKILLED CRAFTSMEN	170	3.5
FOREMAN, MAINTENANCE	160	3.4
LINEMAN	140	2.9
DIESEL MECHANIC	<u>80</u>	<u>1.7</u>
TOTAL	4200	87.8
TOTAL ALL OCCUPATIONS	<u>4700</u>	<u>100.0</u>

^{1/} Occupational data are rounded, and may not add to the total.



THE SPECIAL TRADE CONTRACTOR'S INDUSTRY

(SIC 17)

THE REPORT ON EMPLOYMENT
IN THE SPECIAL TRADE CONTRACTOR'S INDUSTRY

INDUSTRY CHARACTERISTICS

The special trade contractor's industry consists of those establishments that engage in some special activity within the construction industry. Special trade contractors usually work on a particular sub-contract for the general contractor. Examples include plumber, drywall applicators and electricians. The following presents a listing of the various types of contractors within this industry as classified in Standard Industrial Classification Manual, 1972.

1/(SIC 171) Plumbing, heating (except electric), and air conditioning, which includes water pump installation, sewer hookups, plumbing installation and repair, sprinkler system installation, heating installation and related.

(SIC 173) This group includes those contractors engaged in electrical construction. Examples include telephone installation, burglar alarms, communication installation and general electrical work.

(SIC 174) This group includes bricklayers, stonework, marble work, plastering, drywall, sheetrock, installation, lathing, taping, terrazzo, tile, marble and mosaic related work.

(SIC 175) This minor group consists of carpentry work such as garage door installation, and other types of carpentry, as well as carpet and other types of floor covering installation.

(SIC 176) Those establishments dealing in roofing construction and repair and sheet metal work. Metal ceilings, downspout and gutter installation would be included in this minor group.

(SIC 177) This group contains those contractors involved with concrete and related construction. This includes asphalt work on driveways, blacktopping of driveways and parking areas, foundation work, concrete flooring, sidewalks, etc.

(SIC 178) This minor group encompasses the drilling and servicing of water wells.

(SIC 179) This group includes a wide spectrum of miscellaneous special trade contractors. Examples are the following:

1/ Standard Industrial Classification Manual, 1972; Executive office of the President, Office of Management and Budget, U.S. Government Printing Office, Pages 54-56.

THE REPORT ON EMPLOYMENT
IN THE SPECIAL TRADE CONTRACTOR'S INDUSTRY

INDUSTRY CHARACTERISTICS (CONT.)

structural steel erection, iron work, glass and glazing work, excavating work, wrecking and demolition work, elevator and other miscellaneous building equipment, antenna installation, fence construction, swimming pool construction and other types of miscellaneous construction work.

EMPLOYMENT TRENDS

During the seventeen year period from 1960 through 1976, Montana's special trades construction industry employed an annual average of 4,100 people, ranging from a low of 3,500 in 1969 to a high of 5,000 in 1973 and 1974. Linked closely to the building cycle, employment in this industry has experienced a wide variation since 1960. The largest decline was experienced between 1962 and 1964, when employment dropped from 4,500 to 3,600 workers. Other downturns were experienced in 1969 and 1975. The largest employment jump was felt between 1971 and 1973, when an additional 1,300 workers were added to the industry's payroll. This correlated with the state and national building boom in 1972 and 1973.

OCCUPATIONAL CHARACTERISTICS

Of the 5,800 non-farm and wage employees in the special trade industry during August 1976, 4,800 were employed in some type of (maintenance, construction, etc.) job. This represented just over three-fourths of all workers in the industry. Managers and officers accounted for the next largest percentage of workers with 640, 11% of the total employment. The other major occupational groups showed percentages as follows in descending order: clerical 8.1%, professional 1.6%, service 1.4%, sales 1%, and technical 0.9%.

The six largest specific occupations (electricians, plumbers and/or pipe-fitters, managers and officers, sheet metal workers, laborers and carpenters), accounted for just over half of the total employment during the survey month.

TABLE XVIII
EMPLOYMENT IN THE SPECIAL TRADE CONTRACTORS INDUSTRY
IN THE UNITED STATES (SIC 17)
1960 - 1975

<u>YEAR</u>	<u>ANNUAL AVERAGE EMPLOYMENT</u>
1960	1,390,700
1961	1,357,900
1962	1,426,600
1963	1,499,300
1964	1,487,000
1965	1,543,400
1966	1,570,600
1967	1,560,300
1968	1,615,700
1969	1,715,200
1970	1,720,600
1971	1,793,900
1972	1,895,700
1973	1,988,000
1974	1,953,400
1975	1,743,800

Source: Bureau of the Census, U. S. Department
of Housing and Urban Development.

TABLE XIX
 TOTAL WAGE AND SALARY EMPLOYMENT
 IN THE SPECIAL TRADE CONTRACTOR'S INDUSTRY
 (SIC 17)

1960 - 1976

<u>YEAR</u>	<u>ANNUAL AVERAGE EMPLOYMENT</u>	<u>1/</u>
1960	3,900	
1961	3,600	
1962	4,500	
1963	4,000	
1964	3,600	
1965	4,200	
1966	4,200	
1967	3,900	
1968	3,700	
1969	3,500	
1970	3,700	
1971	3,700	
1972	4,400	
1973	5,000	
1974	5,000	
1975	4,700	
1976	4,600	

1/ All data are rounded to the nearest hundred.

TABLE XX
ESTIMATED EMPLOYMENT IN SELECTED OCCUPATIONS IN THE
SPECIAL TRADE CONTRACTOR'S INDUSTRY
(SIC 17)

OCCUPATIONAL TITLE	OES CODE	ESTIMATED EMPLOYMENT	RELATIVE ERROR %	PERCENT DISTRIBUTION	PERCENT OF ESTABLISHMENTS REPORTING THE OCCUPATION
TOTAL ALL OCCUPATION		<u>5794</u>			
MANAGERS AND OFFICERS		<u>635</u>			
All Other Managers & Officers	19000	635	9.66	10.95	68
PROFESSIONAL OCCUPATIONS		<u>90</u>			
All Other Engineers	21900	12	NA	0.19	3
Purchasing Agent	25300	13	43.27	0.22	3
Cost Estimator	25427	65	19.59	1.12	15
TECHNICAL OCCUPATIONS		<u>52</u>			
Electrical Technicians	32004	42	42.83	0.72	3
All Other Technicians	39000	10	NA	0.17	2
SERVICE OCCUPATIONS		<u>84</u>			
All Other Janitors, Porters & Cleaners	41900	84	NA	1.44	6
MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING, POWER PLANT, MINING & PROCESSING OCCUPATIONS		<u>4409</u>			
Mechanic, Maintenance	51043	19	36.39	0.32	4
Refrigeration Mechanic	51052	34	42.28	0.58	4
All Other Mechanics	51900	19	NA	0.32	1
Truck Driver	54000	71	24.05	1.22	0
Boilermaker	55A24	67	NA	1.15	2
Bricklayer	55A31	117	NA	2.01	3
Bricklayer Apprentice	55A31	10	NA	0.17	3
Carpenter	55A47	287	31.35	4.95	11
Cement Mason	55A51	57	39.11	0.98	4
Electricians	55B12	774	20.34	13.35	23
Electricians Apprentice	55B12	48	42.12	0.82	23

ESTIMATED EMPLOYMENT IN SELECTED OCCUPATIONS IN THE
SPECIAL TRADE CONTRACTOR'S INDUSTRY
(CONT.)

OCCUPATIONAL TITLE	ODES CODE	ESTIMATED EMPLOYMENT	RELATIVE ERROR %	PERCENT DISTRIBUTION	PERCENT OF ESTABLISHMENTS REPORTING THE OCCUPATION
MAINTENANCE, ETC., (CONT.)					
Foreman, Maintenance	55B29	94	22.16	1.62	15
Furnace Installers	55B37	46	30.92	0.79	7
Heavy Equipment Operator	55B52	277	24.82	4.78	15
Lather	55B69	21	NA	0.36	2
Metal Fabricator	55B91	27	NA	0.46	2
Painter	55C12	157	32.31	2.70	7
Plasterer	55C28	42	NA	0.72	2
Plumber &/or Pipefitter	55C30	744	24.38	12.84	21
Plumber &/or Pipefitter Apprentice	55C30	40	NA	0.69	21
Roofer	55C58	155	35.97	2.67	7
Sheet Metal Worker	55C81	319	25.63	5.50	13
Structural Steel Worker	55C96	50	NA	0.86	2
Bricklayer Helper	56002	75	NA	1.29	2
Carpenter Helper	56003	73	NA	1.25	3
Cement Mason Helper	56004	96	45.21	1.65	4
Electrician Helper	56005	42	29.02	0.72	7
Painter Helper	56006	34	NA	0.58	2
Plumber Helper	56010	101	34.08	1.74	9
Roofer Helper	56011	57	NA	0.98	3
All Other Helpers Trades	56900	179	NA	3.03	10
All Other Skilled Craftsmen	59001	19	NA	0.32	2
All Other Operatives	59002	42	NA	0.72	2
All Other Laborers	59003	314	22.10	5.41	16
CLERICAL OCCUPATIONS					
		<u>467</u>			
Bookkeepers	61307	178	14.28	3.07	34
General Clerks	61333	115	14.19	1.98	22
Payroll &/or Timekeeper	61351	33	26.29	0.56	8
Secretary	61368	115	15.84	1.98	22
All Other Office Clerical	61900	26	NA	0.44	5
SALES OCCUPATIONS					
		<u>57</u>			
All Other Salesmen	71900	57	36.65	0.98	6

OCCUPATIONS PRESENT IN THE SURVEY
BUT NOT PUBLISHABLE BECAUSE OF RELATIVE ERRORS
GREATER THAN FIFTY PERCENT

Electrical Engineer	Lineman
Mechanical Engineer	Stonemason
Draftsman	Structural Steel Layer
Engineering Equipment	Taper
Asbestos and Insulation	Welders & Flamecutters
Carpet Cutter	Plasterer Helper
Crane-man/Derrick-man & Hoistman	Bookkeeping & Billing Clerk
Dry-wall Applicator	Typist
Glazier	Storeroom Stock Clerk
Hook & Chainman	

TABLE XXI
 ESTIMATED EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP
 IN THE SPECIAL TRADE CONTRACTOR'S
 INDUSTRY
 (SIC 17)

<u>OCCUPATIONAL TITLE</u>	<u>ESTIMATED EMPLOYMENT</u>	<u>PERCENT OF TOTAL</u>
TOTAL ALL OCCUPATIONS	5800 ^{1/}	100.0
MANAGERS AND OFFICERS	640	11.0
PROFESSIONAL OCCUPATIONS	90	1.6
TECHNICAL OCCUPATIONS	50	0.9
SERVICE OCCUPATIONS	80	1.4
MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING, POWER PLANT, MINING AND PROCESSING OCCUPATIONS	4410	76.1
CLERICAL OCCUPATIONS	470	8.1
SALES OCCUPATIONS	60	1.0

^{1/} Occupational data are rounded, and may not add to the total.

TABLE XXII
 ESTIMATED EMPLOYMENT IN MAJOR SPECIFIC OCCUPATIONS
 IN THE SPECIAL TRADE CONTRACTORS INDUSTRY
 (SIC 17)

OCCUPATIONAL TITLE	ESTIMATED EMPLOYMENT	PERCENT OF TOTAL
ELECTRICIAN	770 ^{1/}	13.4
PLUMBER &/OR PIPEFITTER	740	12.8
MANAGERS AND OFFICERS	630	11.0
SHEET METAL WORKER	320	5.5
ALL OTHER LABORERS	310	5.4
CARPENTERS	290	5.0
HEAVY EQUIPMENT OPERATORS	280	4.8
BOOKKEEPERS	180	3.1
PAINTERS	160	2.7
ROOFERS	150	2.7
BRICKLAYER	120	2.0
SECRETARY	110	2.0
GENERAL CLERK	110	2.0
PLUMBER HELPER	100	1.7
CEMENT MASON HELPER	100	1.7
FOREMAN, MAINTENANCE	90	1.6
TOTAL	<u>4480</u>	77.3
TOTAL ALL OCCUPATIONS	<u>5790</u>	<u>100.0</u>

^{1/} Occupational data are rounded, and may not add to the total.

APPENDIX

DEFINITIONS OF SELECTED OCCUPATIONS IN THE CONSTRUCTION INDUSTRY

ALL OTHER HELPERS TRADES: Include all other helpers who assist one or more workers in the skilled trades by performing a variety of duties such as furnishing materials, tools and supplies; cleaning work areas, machines and equipment; holding materials and tools; and performing other routine duties.

ALL OTHER SKILLED CRAFTSMEN: Include all other skilled craftsmen and kindred workers in construction (and other) occupations that require a thorough and comprehensive knowledge of processes involved in the work; the exercise of considerable independent judgment; usually a high degree of manual dexterity; and possibly responsibility for valuable equipment. They usually become qualified by serving apprenticeships or by extensive training.

ALL OTHER OPERATIVES: Include all other operatives and semiskilled workers in construction (and other) occupations who are required to exercise manipulative ability limited to a fairly well-defined work routine; to be vigilant and alert to prevent damage to equipment; to exercise limited independent judgment. These occupations may require the performance to a limited extent of part of a craft or skilled occupation.

ALL OTHER LABORERS: Include all other laborers and unskilled workers in construction (and other) occupations that involve the performance of simple, easily learned duties, involving little independent judgment. These occupations usually do not require previous experience, but familiarity with the occupation is helpful. They vary from light to heavy physical work.

ASPHALT PLANT OPERATOR: Operates stationary or semiportable, power-driven plant that mixes ingredients, such as sand, stone and naphtha to produce asphalt paving material used in road construction.

BOILERMAKER: Constructs, assembles, maintains and repairs stationary steam boilers; follows blue-prints and uses hand and power tools. Assists in testing assembled vessels. Directs cleaning of boilers; inspects and repairs fittings, such as safety valves, regulators, water columns, etc.

CARPENTER: (Exclude cabinet-maker, floorlayer except hardwood, lather, and drywall applicator.) Performs the carpentry duties necessary to make or repair wooden structures, structural members, and fixtures and equipment, using carpentry tools and wood-working machines.

CEMENT MASON: Finishes surfaces of freshly poured concrete walls, roads, walkways, and curbs to specified textures, using handtools, including floats, trowels, screeds.

COST ESTIMATOR: Prepares cost and work completion estimates for engineering contract bids. Computes cost estimates of raw materials, purchased equipment, or subcontracted work and labor.

CRANEMEN/DERRICKMEN AND HOISTMEN: Operate various kinds of cranes and hoists to lift, move, and load materials, machines, and products.

DRAFTER: Prepares working plans and detail drawings from sketches or notes for engineering purposes, according to specified dimensions. Utilizes knowledge of various machines, engineering practices, mathematics, building materials to complete drawings.

DEFINITIONS OF SELECTED OCCUPATIONS IN THE CONSTRUCTION INDUSTRY (Cont.)

DRY-WALL APPLICATOR: Applies plasterboard or other wallboard to ceiling and interior walls of buildings.

ENGINEERING EQUIPMENT MECHANIC: Analyzes malfunction and rebuilds, repairs, and adjusts heavy construction equipment other than internal combustion engines, such as cranes, power shovels, scrapers, paving machines, motor graders, rock crushers, trench-digging machines, conveyors, and bulldozers.

FITTER: Aligns pipeline section preparatory to welding. Signals tractor driver in placing pipeline sections in proper alignment and inserts steel spacer.

FURNACE INSTALLER: Installs and repairs hot-air furnaces, stoves, and similar equipment in accordance with diagrams and other specifications, using handtools and pipe-threading tools.

GLAZIER: Installs glass in windows, skylights, store fronts, and display cases, or on surfaces, such as building fronts, interior walls, ceilings, and tabletops.

HEAVY EQUIPMENT OPERATOR: Operates several types of power construction equipment, such as compressors, pumps, shovels, tractors, scrapers, or motor graders, to excavate, grade earth, pour concrete, etc.

LINEMAN: Strings and repairs cables or wires, installs insulators and erects poles or towers for telephone or electrical power transmission. May work in tunnels.

METAL FABRICATOR: Fabricates and assembles structural metal products, such as framework or shells for machinery, ovens, tanks, stack, and metal parts for buildings and bridges according to job order or blue-prints.

PLASTERER: Applies coats of plaster to interior walls, ceilings, and partitions of buildings to produce finished surface, according to blue-prints, architect's drawings, or oral instructions.

PURCHASING AGENT: Purchases machinery, equipment, tools, raw materials, parts, services, and supplies necessary for operation of an organization.

REFRIGERATION MECHANIC: Installs, services, and repairs refrigerating and cooling systems according to blue-prints and engineering specifications, using knowledge of refrigeration, structural layout, and function and design of components.

REINFORCING IRON WORKER: Positions and secures steel bars in concrete forms to reinforce concrete. Determines number, size, shapes, and locations of reinforcing rods from blue-prints, sketches or oral instructions.

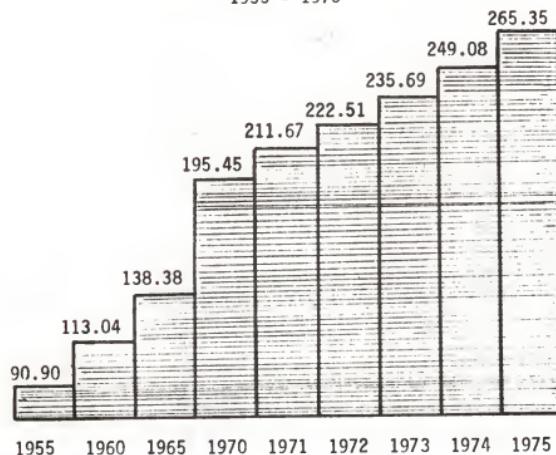
STRUCTURAL STEEL WORKER: Performs any combination of the following duties to raise, place, and unite girders, columns, and other structural-steel members to form completed structures or structural frameworks, working as member of a crew. Hoists and aligns member, fastens member with bolts or rivets, or cuts or welds member to specifications.

TABLE XXIII
U.S. HOURS AND EARNINGS
FOR THE CONSTRUCTION INDUSTRY
(1955 - 1975)

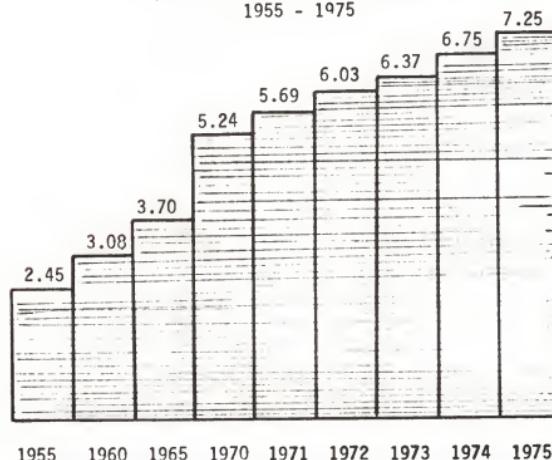
YEAR	AVERAGE HOURLY EARNINGS			AVERAGE WEEKLY HOURS				AVERAGE WEEKLY EARNINGS				
	ALL CONST.	BLDG.	HEAVY HIGHWAY	SPECIAL TRADE	ALL CONST.	BLDG.	HEAVY HIGHWAY	SPECIAL TRADE	ALL CONST.	BLDG.	HEAVY HIGHWAY	SPECIAL TRADE
1955	\$ 2.45	\$ 2.40	\$ 2.23	\$ 2.58	37.1	36.0	40.4	36.7	\$ 90.90	\$ 86.40	\$ 90.09	\$ 94.69
1960	3.08	2.93	2.84	3.29	36.7	35.4	40.6	35.9	113.04	103.72	115.30	118.11
1965	3.70	3.55	3.38	3.94	37.4	36.1	40.8	36.9	138.38	128.16	137.90	145.39
1970	5.24	5.09	4.79	5.55	37.3	36.3	41.0	36.4	195.45	184.77	196.39	202.02
1971	5.69	5.50	5.11	6.08	37.2	36.0	41.0	36.4	211.67	198.00	209.51	221.31
1972	6.03	5.81	5.39	6.45	36.9	35.8	40.2	36.2	222.51	208.00	216.68	233.49
1973	6.37	6.16	5.65	6.82	37.0	36.0	40.3	36.3	235.69	221.76	227.70	247.57
1974	6.75	6.54	6.08	7.19	36.9	36.1	40.2	36.1	249.08	236.09	244.42	259.56
1975	7.25	7.08	6.61	7.65	36.6	36.0	39.5	35.7	265.35	254.88	261.10	273.11

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics,
Employment and Earnings, United States, 1909 - 1975.

UNITED STATES AVERAGE WEEKLY EARNINGS
IN THE CONSTRUCTION INDUSTRY
1955 - 1975



UNITED STATES AVERAGE HOURLY EARNINGS
IN THE CONSTRUCTION INDUSTRY
1955 - 1975



Source: U. S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings; United States 1909 - 1975

TABLE XXIV
 MONTANA HOURS AND EARNINGS
 For The Construction Industry
 1970 - APRIL 1977

	<u>AVERAGE WEEKLY EARNINGS</u>	<u>AVERAGE WEEKLY HOURS</u>	<u>AVERAGE HOURLY EARNINGS</u>
1970	187.22	37.0	5.06
1971	201.85	37.8	5.34
1972	222.68	37.3	5.97
1973	240.64	37.6	6.40
1974	265.54	35.5	7.48
1975	283.14	36.3	7.80
1976	317.54	39.3	8.08
April 1977	338.72	38.8	8.73

TABLE XXV

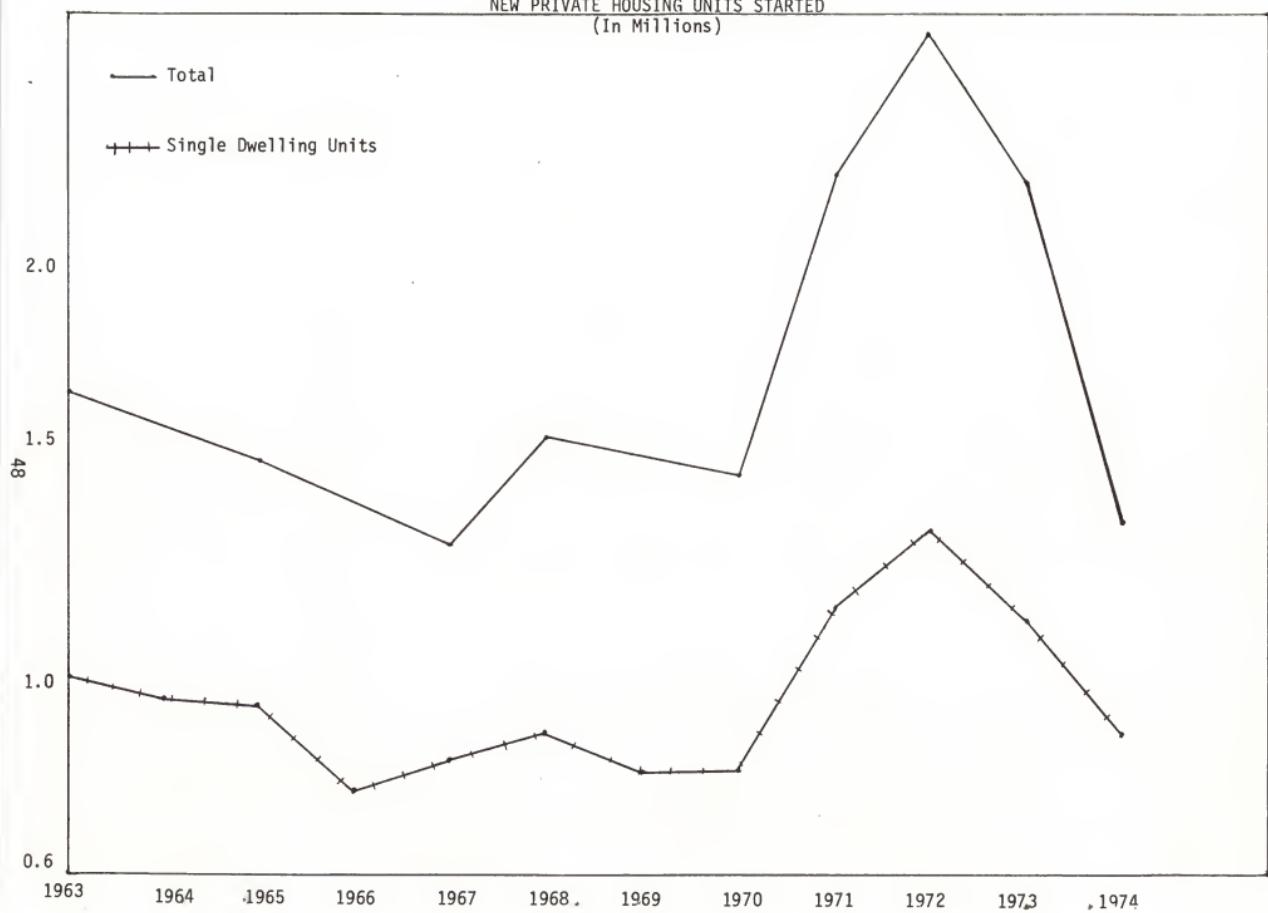
NEW PRIVATE HOUSING UNITS STARTED
(In Thousands of Units)

IN STRUCTURES WITH ----

<u>YEAR</u>	<u>TOTAL</u>	<u>1 UNIT</u>	<u>2 UNIT</u>	<u>3&4 UNITS</u>	<u>5 UNITS OR MORE</u>
1963	1,603.2	1,012.4	52.9	(N/A)	(N/A)
1964	1,528.8	970.5	53.9	54.5	450.0
1965	1,472.8	963.7	50.8	35.8	422.5
1966	1,164.9	778.6	34.6	26.5	325.1
1967	1,291.6	843.9	41.4	30.2	376.1
1968	1,507.6	899.4	46.0	34.9	527.3
1969	1,466.8	810.6	43.0	42.0	571.2
1970	1,433.6	812.9	42.4	42.4	535.9
1971	2,052.2	1,151.0	55.1	65.2	780.9
1972	2,356.6	1,309.2	67.1	74.2	906.2
1973	2,045.3	1,132.0	54.2	64.1	795.0
1974	1,337.7	888.1	33.2	34.9	381.6

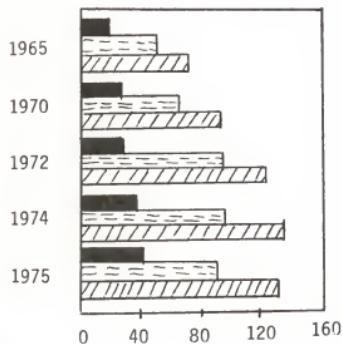
Source: U.S. Department of Commerce, Bureau of the Census,
Construction Reports, Housing Starts April 1977, Page 4.

NEW PRIVATE HOUSING UNITS STARTED
(In Millions)

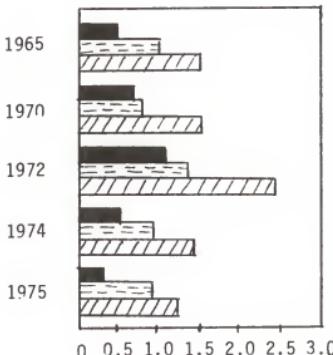


CONSTRUCTION AND HOUSING

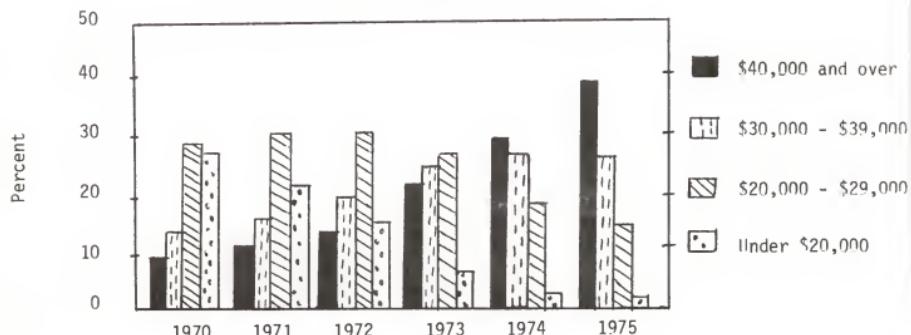
Value of New Construction,
All Types (billions of dollars)



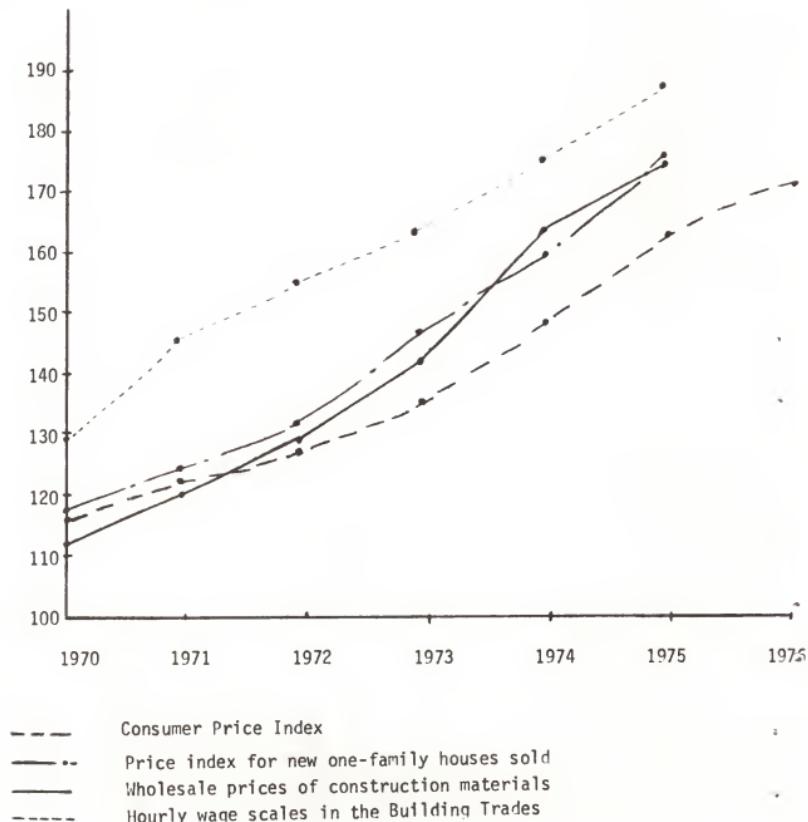
New Housing Units Started
(millions)



Cost of Housing



A COMPARISON OF THE CONSUMER PRICE INDEX AND SELECTED INDEXES
WITHIN THE BUILDING INDUSTRY



METHODOLOGY

A. OES SAMPLE DESIGN.

The sample used in the OES survey represented a number of firms selected from a universe consisting of all construction industry establishments covered under Montana's Unemployment Insurance Law. The sample selected from the universe was stratified into three groups: General Building Construction, Heavy and Highway Construction, and Special Trades Construction Industry. Each stratum was then classified into nine cells based on employment levels by firm. The sampling ratio was selected with respect to the employment totals in each size cell. For large size cells, which had fewer establishments, the proportionate sample ratio was smaller; for small size cells, which had more establishments, the proportionate sampling ratio was larger. Altogether over seventy-eight percent of the total employment in the Construction Industry was covered.

B. SURVEY CORRESPONDENCE.

1. Interviews were conducted via mail, telephone, and personal visits by Local Office personnel. Each establishment selected in the sample received a detailed survey form. Each survey form listed questions concerning employment levels, job titles, and job descriptions. The various job descriptions were prepared by the Bureau of Labor Statistics and were tested by occupational analysis field centers of the Employment and Training Administration, assuring accurate classifications of job descriptions. Also, to assure occupational homogeneity, the surveyed firms were separated into the three major groups within the construction division. Further, to assure consistency in the data, establishments in the survey were asked to use the month of August as the survey month.

2. The OES Construction Industry survey contained seven occupational categories:

- 1) Managers and Officers
- 2) Professional Occupations
- 3) Technical Occupations
- 4) Service Occupations
- 5) Maintenance, Construction, Repair, Material Handling and Power-plant Occupations.
- 6) Clerical Occupations
- 7) Sales Occupations

3. Occupational Classification.

The occupational classification system used in this OES program assumes a compromise classification between the 417 job titles from the Bureau of the Census and over 21,741 job titles from the Dictionary of Occupational Titles (DOT). By using both sources, this more flexible OES structure has the capability of taking advantage of some of the broad socio-economic characteristics of the Bureau of the Census and at the same time preserving the ability to provide DOT job definitions for Manpower Training and Analysis. Various occupations have been classified in the "all other" residual categories, because 1) only minimal on-the-job training was required, or 2) these occupations did not have significant numbers of employees. However, great care was exercised to insure the availability of specific employment figures for occupations which require significant amounts of education and/or training.

4. Survey Processing and Screening.

After data were collected, corrections were made, data were thoroughly screened, and final editing procedures were used to produce a "clean data file". The resulting clean data file is used to produce the occupational employment

estimate for the three industry groups in the Construction Industry group.

The estimating process uses ratio estimates and a series of weighting factors dependent upon the size cell of an establishment. For example, if the sampling ratio, or probability, of sample selection is one out of every five establishments, then the sample weight is five. This result is thus called the weighted reported occupational employment. The ratio for each size class is computed from summed weighted reported data and then this ratio is multiplied by the occupational employment as of the reference date. Accurate and reliable computed ratios are extremely important for obtaining precise estimates for employment patterns. After the employment estimates are calculated for each of the size cells, the results are summed to produce occupational estimates for each industry.

5. Reliability and Accuracy of Occupational Employment Estimates.

Precision of statistical data is an essential criteria for manpower education and training to successfully analyze these estimates. To optimize precision, the following types of errors must be minimized:

- a) Non-sampling errors - these are errors that arise from faulty responses to survey questionnaires, physical errors in processing surveys, inaccurately furnished data, and inadequate planning and data collecting. Great care in obtaining a "clean data file" has minimized non-sampling errors in the construction industry survey.
- b) Sampling errors - these are errors that result from the difference between the sample data estimate and the entire population parameter, i.e. the construction universe. This type of error is strictly due to sampling techniques.
- c) Standard errors - these errors are the square root of the variances of the estimates, where the variance of an estimate is equal to the product of squared and weighted sample observations and a series of correction factors needed when sampling from a finite population.
- d) Relative error - these errors are an important tool in measuring the precision of an occupational employment estimate. Relative error expresses the standard error of an estimate as a percentage of that estimate, i.e. relative error times occupational employment estimate is equal to the standard error. More precisely, if there are 100 managers and officers in highway construction and relative error is

10 percent, then the standard error is simply 10. For example, assume we estimate a total of 300 managers and officers in all the size classes in the construction industry, and the standard error is computed as 40. This error measures the precision about the estimate of 300 managers and officers. Applying the formula, the relative error, then, expressed

as a percent, is simply: $\frac{40 \times 100}{300} = 13.33\%$, at one standard deviation.

That is, at one standard deviation from the true construction universe population of managers and officers, our estimate of 300 gives us a relative error of 13.33% at a level of confidence of 68%. Therefore, we can say that 68% of the time our estimate will be $300 \pm (.1667 \times 300)$, or between 260 and 340 managers and officers. Because of the fluctuation of the relative error from one occupational characteristic to another, an optimum sample design is virtually nonattainable.

NOTE: Only those specific occupations with a relative error 50% or less were put in the publication. All occupations with relative error greater than 50% were put in the residual "all other" categories. As such the relative error was not computed for the residual categories.

MOES SAMPLE FOR THE CONSTRUCTION INDUSTRY

